

## A NEW CALOCHORTUS FROM DOUGLAS COUNTY, OREGON

M. Ray Godfrey, 1535 NW Beacon St., Roseburg, OR 97470  
Frank T. Callahan II, 6045 Foley Ln., Central Point, OR 97502

### ABSTRACT

*Calochortus coxii* Godfrey & Callahan, a serpentine endemic of Douglas County, Oregon is described. A comparison with *Calochortus tolmiei* H. & A., a related species is made. A relationship between *Calochortus howellii* Wats. and *Calochortus umpquaensis*, N. Fredricks, (1989) ined., is established.

On June 18, 1988, Marvin Cox of Canyonville, discovered a population of *Calochortus* in bloom on a serpentine slope between Boomer Hill and Myrtle Creek. He noticed some distinctive floral features and wondered if this could be a new species or a variety of *Calochortus tolmiei*. A short while later, news of his discovery was relayed to Ray Godfrey. On the 29th of June, the two met and proceeded to the site to collect herbarium specimens. At a later meeting with the authors, Mr. Cox requested their participation in describing his new discovery.

*Calochortus coxii* Godfrey & Callahan sp. nov. (Fig. 1)

*Calochortus tolmiei* H. & A. affinis, *Calochortus coxii* a qua differt floescencia seria circum duobus mensibus; folio ciliato secus venus superficie; glandula petali impressa profunde; pilis luteis proxime super glandulam; in petalo supra pilis luteis  $\wedge$ -formi sublavendus; stigmatate elevato in extensione gracili styliforme; antheris cinnamomeis; seminibus albostramineis maturitate.

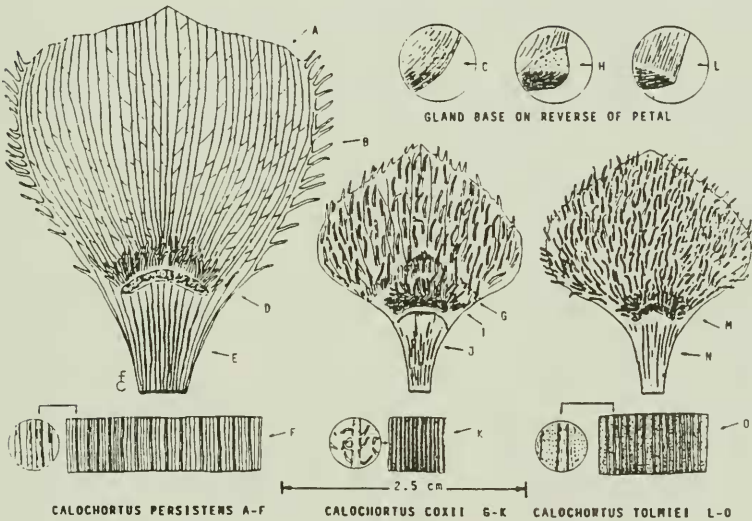
*Calochortus coxii* Godfrey & Callahan. Bulb whitish 1-2 cm long x 1.5 cm wide, coated with dull chocolate brn. membranous bulb coats. Leaf solitary,  $\pm$  erect to 3 dm long x 3-7 mm wide, with densely hairy inner surface, outer surface. Glabrous/shiny. Flowering stem erect to flexulose 15-25 cm tall with one or several bracts 2.5-3 cm long. Flowers 1-7 on erect pedicels, sepals  $\pm$  20 mm long x  $\pm$  8 mm wide ovate acuminate, petals broadly obovate 2.5 cm+ long white with reddish striations from base to deeply impressed gland, well covered with membranous scale. Scale covered with translucent very small rod-like hairs, inner base of gland green. Yellow hairs,  $\pm$  overlapping gland, grading to white at petal tips. Just above gland exists a broad lavender chevron extending to petal edges. Petal edges  $\pm$  fringed & with hairs. Anthers apiculate 3-7 mm long, reddish brown. Filament  $\pm$  7 mm long. Capsule elliptic elongate 3-4 cm long x 1.5+ cm. wide with 4 mm long and recurved "style", 3 winged and nodding. Seeds lt. straw yellow with rough surfaces.

TYPE: USA: Douglas County, 43°01'48" 123°19'20"W 256 m. abundant northern slope, Oregon State Highway Dept. Survey Pt. "Myrtle", on ultramafic soil base, 29 June 1988 M. Cox & R. Godfrey Holotype: CAS. Isotypes: K, US, SOC, UC, OSC, Douglas Co. Museum, Roseburg, BLM Herbarium.

*Calochortus coxii* and *C. tolmiei* (both species of section *Calochortus* = *Eucalochortus*) share the following characteristics: have the same habitat locally, have similar petal size and shape, and have apiculate anthers (see Table I. and Fig. 1)

TABLE 1. Differences between *C. coxii* and *C. tolmiei*.

	<i>C. coxii</i>	<i>C. tolmiei</i>
Blooming time	late June, early July	March, early May
Inner leaf surface	densely hairy along veins	glaucous/glabrous
Outer leaf surface	shiny dark green	glaucous
Petal gland	larger & strongly impressed	slightly impressed
Hairs above gland	yellow	purple, rarely pink
Stigma	raised on a style-like extension	sessile
Anthers (color)	reddish brown	pale lavender

Fig. 1. A comparison of *Calochortus persistens*, *C. coxii* and *C. tolmiei*.

A. Petal base pink B. Fringed petal margins C. Gland base not strongly protruding D. Clustered yellow hairs above gland E. Pink/red striations petal base to gland F. Inner leaf surface section showing veins with glaucous, glabrous surface.

G. Lavender chevron on petal H. Protruding green gland base I. Yellow hairs above gland J. Red striations on white petal base K. Inner leaf surface section showing minute hairs on raised veining.

L. Protruding gland base M. Purple/pink hairs above gland N. Purple/pink striations O. Inner leaf surface section glabrous

*Calochortus coxii* is also compared with *C. persistens* Ownbey (subsection Nitidi), Fig. 1. The latter species also has nodding capsules, but differs in its persistent perianth parts (the perianth parts are shed as the capsule matures in all other *Calochortus* species). The seeds of both species are light yellow and the petals in bud are light pink.

*Calochortus coxii* shares many traits with *C. howellii* of Josephine Co. and *C. umpquaensis* of Douglas Co. *Calochortus howellii* is unique in having an erect capsule that is considerably smaller than capsules of the preceding two species. *C. coxii* and *C. howellii* bloom at about the same time, about a month later than *C. umpquaensis*. Because of their differences, these three species do not fit well in either subsection Eleganti or subsection Nitidi.

Ownbey (1940) placed *C. persistens*, with its apiculate anthers in subsection Nitidi, because "its nodding capsule separates it from the remainder of subsect Nitidi, and suggests affinity with subsect Eleganti, but on all other characters is best placed with the former subsection." *C. persistens* with its apiculate anthers and nodding capsules does not fit well in either subsections. In spite of this, Ownbey (1940) placed the species in subsection Nitidi. Ownbey (1940) placed *C. howellii* in subsection Nitidi based on its erect capsule and habit, but noted "it's distally branched gland processes and merely roughened seedcoats mark it as very distinct from any other known species of the section Eucalochortus." He evidently failed to notice the densely hairy inner leaf of *C. howellii*, a character mentioned in Peck's description (1973). However, in the same group, *C. coxii* and *C. umpquaensis* have nodding capsules.

It seems evident that these three species warrant a new subsection within the genus *Calochortus*. Considering the similar characters shared by *C. coxii*, *C. howellii*, *C. umpquaensis*: especially the densely hairy inner leaf surfaces not found in any other known species of *Calochortus*; the style-like extension of the ovary; the apiculate anthers; the light yellow seed with roughened testa and their serpentine endemicity. The subsection position of these species seems intermediate between that of subsection Nitidi and subsection Eleganti. *C. coxii* differs from *C. howellii* and *C. umpquaensis* having flowers with a strongly protruding gland base; yellow hairs above the gland; a light lavender chevron and red striations at the petal base. (See Fig.1). The ancient North Klamath province seems to be the center of speciation for this unique group of *Calochortus*. All species known of this group thus far, including two additional undescribed taxa, are Oregon endemics.

The principle plants associated with *Calochortus coxii*: *Calocedrus decurrens* (Torr.) Florin, *Festuca idahoensis* Elm, *Pinus jeffereyi* Murr., *Calochortus tolmiei* H&A. *Allium mirabile* Hend., *Pinus ponderosa* Doug. Plant associations of secondary importance include: *Umbellularia californica* (H&A.) Nutt., *Rhododendron occidentale* (T&G) Grey, *Pseudotsuga menziesii* (Mirb.) Franco, *Silene hookeri* Nutt. and *Arbutus menziesii* Pursh.

Because of its late blooming cycle and the dessicated soils of southern exposed slopes, *Calochortus coxii* is confined to shady north-facing mesic sites. The largest populations are found near ridge-line summits on soils derived from serpentinite rock. The plants are distributed from 256 m above the Umpqua River to 849 m at Myrtle Creek Mountain. The ultramafic intrusives are thrust thru early Jurassic Dothan & Dothan volcanics in line with a northeast tending fault band (Wells & Peck, 1983), with an exposed terminus north of Little River (along the North Umpqua River).

The Global Distribution Range (GDR) of *C. coxii* is 43°00' 15"N, 123° 21'53"N (Sheep Hill) northeast to 42°05'04"N, 123 00'15"W (T28S R5W Sec.35). The species grow on private, state, and federal lands, with considerable human disturbance i.e., livestock, roads (Interstate 5 intersects a large population), and logging. In fact, BLM roads and a gravel quarry disturb several populations. Part of the habitat has been grazed and logged since pioneer settlement, mostly without apparent damage to the *Calochortus* populations. We have observed that the germination of *Lilium* and *Calochortus* seems to be enhanced on mineral soils following soil disturbance (such as fires). Overgrazing by sheep, as on Sheep Hill, has apparently caused reduction in the size of the population. Large numbers of plants occur in an adjacent fenced area where sheep were excluded.

*Calochortus coxii* appeared to be quite rare where Mr. Cox made the original discovery, however, extensive field surveys by the authors showed a series of discontinuous populations widely distributed over an 11 square mile area (2851 hectares).

*Calochortus coxii* presently exhibits a good population base but should be placed on the "sensitive plant" list, as its survival seems linked to minimizing man's impact on the habitat areas. The authors recommend the status of *C. coxii* be determined by the office of the Oregon Endangered Plant Species Program.

Both authors are grateful to: Nelda Lewis & Joyce Schmidt, for the latin diagnosis; Dr. Frank A. Lang, for criticisms and reviews of the manuscript; Dr. Kenton Chambers, for his comments; Nancy Fredricks, the author of *C. umpquaensis*; the always generous Boyd Kline, for use of his living *Calochortus* collections; Cliff Bryden, for his assistance to explore much of the plant's distribution on his property; and Karen Callahan and Maria Ewaldsen who typed the manuscript.

#### Literature Cited

- Fredricks, N. 1989. Morphological Comparison, *Calochortus howellii* and a new species from Southwestern Oregon, *C. umpquaensis* (Liliaceae). Systematic Botany. 14: (in press)
- Ownbey, M. 1940. Monograph of the Genus *Calochortus*. Ann. of the Missouri Botanical Garden. 27:371-561
- Peck, M.E. 1973. A Manual of the Higher Plants of Oregon, Oregon State University Press, Corvallis.
- Wells & Peck 1983 Geologic Map of Oregon West of the 121st Meridian, Oregon State Department of Geology.